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Shinji Yokono

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EXAMINER

LIN, JAMES

ART UNIT

PAPER NUMBER

1762

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/611,961

Applicant(s)

YOKONO ET AL.

Examiner

Jimmy Lin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 7 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

The claim requires that the visible light has a wavelength that does not excite the phosphor material to emit light. However, the phosphor material in independent claim 1 intrinsically does not become excited with an exposure to visible light, and visible light by itself inherently does not excite phosphor material to emit light. Thus, the limitation of claim 7 does not further limit claim 1 due to the intrinsic properties of visible light and phosphors.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-8 and 15-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims require the limitation “wherein said determination is performed in accordance with a relationship between various conditions of the phosphor material in a cell after said drying process and various patterns of said phosphor material obtained from said visible light reflected from said phosphor material in the cell before said drying process”. One of ordinary skill in the art would not be able to determine the breadth of the claim because the terms “various conditions” and “various patterns” are vague and can encompass innumerable different conditions and patterns. One of ordinary skill, therefore, would not be able to ascertain the full scope of the limitations “various conditions” and “various patterns”. Additionally, the specification does not provide enough direction and guidance for one of ordinary skill to use the

claimed invention. Undue experimentation would be required to determine the “various conditions” and “various patterns” in order to practice the claimed invention.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-2, 4-8, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iguchi et al. (WO 98/27570, references made are to the English equivalent U.S. Publication No. 2002/009536) in view of KR 1999-85889 and Nishiyama et al. (U.S. Patent 6,797,975).

Iguchi discloses a method of making a plasma display panel (PDP), wherein phosphor paste is printed between barrier ribs (abstract; Fig. 1).

Iguchi does not explicitly teach an inspection method. However, ‘889 teaches that inspecting printed phosphors in the art of PDPs is obvious, as discussed above.

‘889 teaches that some sort of inspection is required to determine the condition of the printed phosphor, but does not explicitly teach that inspection method comprises radiating light onto the surface of the phosphor and observing the reflected pattern of light reflected. However, Nishiyama teaches that a PDP can be inspected for pattern defects using white light (i.e., radiating the white light onto the surface and observing the reflected light) (col. 5, lines 7-50).

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The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have inspected the phosphor of Iguchi and '889 using the method of Nishiyama with a reasonable expectation of success because Nishiyama teaches that such an inspection method is suitable for detecting pattern defects.

Iguchi, '889, and Nishiyama do not explicitly teach that the step of detecting whether or not an amount of the phosphor material applied to each of said plurality of cells is suitable, excessive, or small. However, Iguchi does recognize the need for forming a uniformly thick phosphor layer in order to achieve higher uniformity in luminance and display. A phosphor layer not uniformly thick is essentially a phosphor layer that has portions that is either excessive or small. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have inspected for uniformity of the phosphor layer of Iguchi. One would have been motivated to do so in order to have produced a higher quality finished product.

Iguchi, '889, and Nishiyama do not explicitly teach that the phosphor is inspected before drying. However, the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See, for instance, *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have radiated the light onto the phosphor material *prior* to drying instead of radiating the light onto the phosphor material *after* drying with the expectation of similar results and with a reasonable expectation of success because the detection of flaws is possible before or after drying the phosphor material.

Iguchi, '889, and Nishiyama do not explicitly teach that the determination is performed in accordance with a relationship between various conditions of the phosphor material in a cell after the drying process and various patterns of the phosphor material obtained from the reflected visible light. However, one of ordinary skill in the art would have expected the flaws found in the deposited phosphor material prior to drying to carry over after the drying of the phosphor material. For example, an amount of phosphor material applied that is too small prior to drying would still be too small of an amount after drying. In view of the references as a whole, one of ordinary skill would have looked for certain patterns (e.g., an amount of phosphor being too

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small) prior to drying with the knowledge that such patterns would lead to flaws after drying. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have correlated certain patterns in the deposited phosphor material prior to drying to a flaw after drying and to have made a determination of a flaw prior to drying based on such a correlation.

Claim 2: Nishiyama teaches that an image of the reflected light can be captured (col. 6, lines 18-24).

'889 teaches that each of the printed phosphor material of the same color is inspected before continuing to the next process step. Iguchi teaches that the phosphor material of the same color can be printed into multiple cells simultaneously, thereby requiring the inspection of every cell. Therefore, the images of each cell must necessarily be distinguished from one another in order to determine the printed condition of each phosphor material in each cell.

Because this inspection of pattern defects is performed prior to drying the phosphor material, the inspection will necessarily determine whether or not a phosphor layer formed by drying the phosphor material will normally be formed. Any pattern defects in the phosphor material prior to drying will carry over into the dried state.

Claim 4: Nishiyama teaches that the inspection method can detect pattern defects, as discussed above.

Claim 5: The inspection must necessarily have some sort of basis of comparison (i.e., a previously inspected PDP substrate).

Claim 6: Iguchi teaches that one phosphor color can be applied at a time [0263]. '889 teaches that an inspection step takes place after the respective applications of each of the phosphor materials R, G, and B (abstract). Previous inspections of the same substrate is taken into account such that having found no flaws found up to the point of the current inspection is noted.

Claim 7: Fitzpatrick and Iguchi are silent as to whether the visible light radiated onto the phosphor material causes the phosphor material to become excited and emit light. However, the Applicant teaches that at least certain wavelengths of visible light do not excite the phosphor material (pg. 22, lines 2-7). Thus, the visible light of Fitzpatrick must necessarily have some wavelengths that do not excite the phosphor.

Claim 8: Iguchi teaches that the phosphor paste can be applied by a printing technique (Figs. 1,5-8).

7. Claims 3-4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iguchi '570 in view of KR 1999-85889 and Nishiyama '975 as applied to claim 2 above, and further in view of Isberg et al. (U.S. Patent No. 5,998,085) and Hayashi et al. (U.S. Publication No. 2002/0063527).

Iguchi, '889, and Nishiyama are discussed above. Nishiyama teaches that pattern defects can be detected, but does not explicitly teach that the defect can be a pinhole. However, Isberg teaches that pinholes in a phosphor layer is a known pattern defect for PDPs (col. 1, lines 50-54; col. 2, lines 13-16). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have inspected for pinholes in the PDP phosphor layer of Iguchi with a reasonable expectation of success because Nishiyama teaches the inspection of pattern defects and Isberg teaches that pinholes are well-known pattern defects.

Nishiyama does not explicitly teach the step detecting whether or not phosphor material flows into a cell to which said phosphor material is not yet applied so far. However, Iguchi does teach that the phosphor layers are separated by barrier ribs (Fig. 1). Hayashi teaches that it is well known in the art of PDPs that barrier ribs are used to prevent the different colored phosphors from mixing with each other [0010]. The mixing of colored phosphors will lower the contrast and resolution of the display, thereby causing a pattern defect because the pattern is not intended to have phosphors flow into adjacent cells. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have inspected for phosphors flowing into the adjacent cells of Iguchi with a reasonable expectation of success because Nishiyama teaches the inspection of pattern defects and because Hayashi teaches that the mixing of colored phosphors is a known pattern defect.

Claim 4: A pinhole can be interpreted to be a micro-defect. Phosphors flowing into an adjacent cell can be considered a macro-defect.

8. Claims 1, 5, and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iguchi '570.

Iguchi discloses a method of making a PDP as discussed above, but does not explicitly teach the step of inspecting whether or not a phosphor material is properly applied to each of said cells prior to drying said phosphor material by radiating light onto a surface of the phosphor material and observing a pattern of light reflected from each of said plurality of cells. However, an operator or engineer walking through the manufacturing process can take a look at the phosphor layer that has been applied to PDP substrate prior to drying. Such a walk-through is typical in the manufacturing plants to ensure that the product line is operating properly. In addition, a sample could be taken off the product line after the application of the phosphor and prior to drying in order to observe the quality of the deposition apparatus. In either case, some sort of visible light must be provided so that the PDP substrate can be observed, and this light will necessarily reflect off the phosphor layer. The observer can then make a mental note that the applied phosphor amount is suitable. With the knowledge that the applied phosphor amount is suitable, the observer would have recognized that the amount of phosphor after drying will be suitable as well because a suitable amount applied prior to drying is expected to form a film having a suitable amount after drying.

Claim 5: The observer must have some sort of comparison when determining that the phosphor amount applied is suitable. The comparison could be made relative to previously seen PDP substrates.

Response to Arguments

9. Applicant's arguments, see pg. 8, filed 6/4/2007, with respect to claims 1-2, 4-8, and 15-16 have been fully considered and are persuasive. The 35 U.S.C. 112, second paragraph rejection of the claims has been withdrawn.

10. Applicant's arguments, see pg. 8, filed 6/4/2007, with respect to claims 2 and 6 have been fully considered and are persuasive. The 35 U.S.C. 112, first paragraph rejection of the claims has been withdrawn.

11. Applicant's arguments filed 6/4/2007 have been fully considered but they are not persuasive.

Claims 1-2, 4-8, and 15 as rejected over Iguchi '570, '889, and Nishiyama '975:

The Applicant argues on pg. 10-11 that the combination of references do not teach or suggest that a determination is performed in accordance with a relationship between various conditions of the phosphor material in the cell after a drying process and various patterns of the phosphor material obtained from visible light reflected from the phosphor material in the cell before the drying process. However, such is obvious as discussed above. Additionally, the specification does not enable limitations for the reasons discussed above.

Claims 1, 5, and 7-8 as rejected over Iguchi '570:

The Applicant argues on pg. 12 that Iguchi does not suggest the newly added limitations. However, such is obvious as discussed above and, further, is not enabled by the specification.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is 571-272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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FRED J. PARKER
PRIMARY EXAMINER